Oregon Cooperative Fish & Wildlife Research Unit
Oregon State University, 104 Nash Hall, Corvallis, Oregon 97331-3803
T 541.737.1938 | **F** 541.737.3590 | **E** orcfwru@oregonstate.edu

16 August 2014

Sondra Ruckwardt, Project Manager
ATTN: CENWP-PM-E-14-08
U.S. Army Corps of Engineers, Portland District
P.O. Box 2946
Portland, Oregon 97208-2946

Dear Ms. Ruckwardt:

I write this letter as the Principal Investigator (PI) for research, monitoring, and evaluation related to avian predation on juvenile salmonids in the Columbia River estuary. I have served as PI for this project, which has been jointly funded by the U.S. Army Corps of Engineers - Portland District (Corps) and the Bonneville Power Administration (BPA), for 18 years. I would like to address the scientific basis for the Draft Environmental Impact Statement (DEIS) to Reduce Double-crested Cormorant Predation of Juvenile Salmonids in the Columbia River Estuary in my capacity as PI on this long-term research project, as Unit Leader for the U.S. Geological Survey's Oregon Cooperative Fish and Wildlife Research Unit, and as Professor of Wildlife Ecology at Oregon State University. The professional opinions expressed in this letter are not necessarily those of my supervisors or those I supervise, nor are they necessarily those of the U.S. Geological Survey or Oregon State University.

The DEIS represents a major effort to assemble and compile the relevant information for a complex and complicated natural resource management issue, and the Corps, plus its cooperators and contractors in the preparation of the DEIS, are to be commended for their efforts. Nevertheless, there are aspects of the DEIS and the selection of the Preferred Alternative that are either unsupported by the science, or at variance with the best available science. In many cases the relevant science was produced by the research group that I lead, and I am likely more familiar with the body of scientific work cited in the DEIS than any other scientist.

The DEIS and subsequent outreach efforts by the Corps imply that a non-lethal management technique – habitat restriction to induce breeding dispersal away from East Sand Island - has already been attempted and has not been successful. This misrepresents the scope of experiments that our research team conducted during 2011-2013 to test such a technique, experiments that were funded by the Corps. Those experiments restricted habitat very successfully and induced temporary dispersal from East Sand Island; however, sufficient nesting habitat was retained – by design – to allow all cormorants to continue nesting at East Sand Island if they chose to, which they did. It is incorrect and misleading to imply that non-lethal management techniques have been attempted and have failed in advance of selecting a primarily lethal management approach as the Preferred Alternative in the DEIS.

The DEIS unjustifiably downplays the potential to manage cormorant dispersal from East Sand Island under Alternative B, citing perceived high cost, logistical complexity, and high risk of simply moving the problem to a new location or possibly even exacerbating the problem. The DEIS fails to acknowledge that the Oregon Department of Fish and Wildlife (among others) has successfully administered a large-scale multi-estuary non-lethal cormorant hazing program on a very modest budget. The DEIS also fails to

acknowledge that the management of cormorant nesting habitat to reduce fisheries conflicts (e.g., hazing to limit cormorant nesting in areas of fisheries concerns) has been successfully used on a large scale elsewhere (e.g., New York State, Denmark), as an alternative to culling thousands of cormorants. The DEIS ignores the susceptibility of cormorants to human or other disturbance, particularly during the early stages of colony formation. Human or other disturbance is the most often cited cause of cormorant colony failure and abandonment in the scientific literature. Experiments at East Sand Island during 2010-2012 successfully dissuaded cormorants from nesting in designated portions of the island, despite a long history of cormorant nesting in those areas. Taken together, these scientific studies and previous management efforts provide compelling evidence for the feasibility of non-lethal methods for reducing cormorant predation on salmonid smolts in the Columbia River estuary.

The DEIS implies that locations where cormorants would disperse to from East Sand Island are unpredictable. In actuality, experiments conducted by our research team and funded by the Corps investigated possible dispersal locations and behavioral strategies, and demonstrated that currently active and historical colony sites are the most likely locations that dispersing cormorants would attempt to nest. These sites are well known and readily monitored. The DEIS indicates that sites elsewhere in the estuary and lower Columbia River would be the primary dispersal locations explored by cormorants. This conclusion fails to acknowledge substantial use by cormorants from East Sand Island of sites in coastal Washington and British Columbia, areas of reduced conflict with fisheries, during Corps-funded dispersal experiments. Additionally, active colonies elsewhere in the Columbia River estuary and lower river utilize artificial structures with either limited capacity to support additional cormorant nests (e.g., navigational aids or transmission line towers) or are located in areas readily hazed (e.g., bridges). The DEIS exaggerates the risk of cormorants dispersing from East Sand Island and competing with ESA-listed streaked horned larks for nesting habitat in the Columbia River estuary. There is little overlap in habitat preferences between cormorants (vertically structured habitats that facilitate stick nest construction, such as trees, shrubs, rip-rap, driftwood piles) and streaked horned larks (bare or sparsely vegetated flat sandy areas) in the lower Columbia River and estuary. Finally, the DEIS fails to recognize the potential of social attraction techniques to attract dispersing cormorants to acceptable existing or former colony sites. Experiments funded by the Corps and conducted by our research team to explore this technique were misinterpreted and the potential for successful application was unjustifiably downplayed.

Whereas the DEIS exaggerates the uncertainty and risks associated with non-lethal management techniques that are part of Alternative B, the DEIS substantially downplays the uncertainty and risks associated with Alternative C (large scale culling), the Preferred Alternative. The effect of the proposed cull (~ 16,000 individuals) represents about a quarter of the cormorant population west of the Continental Divide. This is because about 40% of the breeding adults in the western population nest at the East Sand Island colony, and the reduction of that colony by two-thirds using lethal take would necessarily have a major impact on total population size. Banding and satellite telemetry studies, conducted by our research team and funded by the Corps, have demonstrated the connectivity of the East Sand Island colony with other colonies from British Columbia to the Mexican border, and from the coast to the Continental Divide. Thus the local management action in the Columbia River estuary to reduce the numbers of double-crested cormorants will have a major population-wide impact throughout western North America.

The DEIS indicates that the proposed annual take for the East Sand Island cormorant colony under the Preferred Alternative is similar to those in cormorant culling programs east of the Continental Divide in terms of the number of individuals culled; however, the effect of the proposed take level on the

cormorant population west of the Continental Divide (a distinct management unit) is substantially greater. At least 1/4th of the western population is proposed to be culled at a single site, a very different scale of action than any culling program within the range of the eastern population. The size of the East Sand Island colony assumed at the onset of the culling program is an average colony size during 2004-2013 (12,917 breeding pairs), rather than a more recent (2011-2013) average (13,420 breeding pairs), or the most recent estimate of colony size (14,900 breeding pairs in 2013). A larger initial colony size will require a larger cull to reach the management objective. The potential for cormorant immigration to East Sand Island is also not adequately considered in the projections of how many cormorants would need to be killed to reach the target colony size. Colony size trends over the last 15 years, and most recently in 2013, suggest substantial immigration has occurred to the East Sand Island colony, and could occur again. Any substantial immigration during the culling program would require a larger cull to reach the management objective. Experiences with major cormorant culling operations in the Upper Midwest indicate that the level of cormorant culling necessary to reach target population sizes can be several times greater than the difference between current cormorant population size and target population size after management. Taken together, these data and observations indicate that the estimated total cull of ~ 16,000 cormorants to reach the target colony size of ~ 5,600 breeding pairs significantly downplays the level of lethal take that would be required, perhaps by a factor of two. Consequently, the numbers of cormorants taken as part of the cull may significantly exceed one quarter of the entire western population in order to reach the target colony size, and thereby place the western population at greater risk.

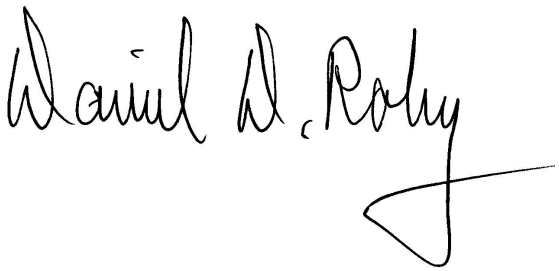
The DEIS proposes that an estimate of population size circa 1990 is sustainable (*sensu* the minimum viable population). Little justification for this choice is provided except that this was the size of the western population before the East Sand Island colony began to increase substantially during the 1990s. The reasoning seems to be that if the population consisted of about 20,800 breeding pairs before the advent of the East Sand Island colony, then the carrying capacity of the available nesting habitat exclusive of East Sand Island should still be at least as high as it was in 1990. This ignores the recent status and trends of major colonies in the western population. Notably, the three most significant nesting areas in the western population since the 1990 census all have uncertain but likely negative trajectories: East Sand Island (the culling program outlined in the DEIS), Upper Klamath Basin (drought, water allocation issues), and the Salton Sea (reduced water allocation, drought). Cormorant colonies in coastal British Columbia, Washington, and southern California have been in decline for two decades. In addition, much of the initial growth in the East Sand Island colony was due to immigration from other colonies in western North America, especially those in British Columbia and Washington, suggesting that many of the other colonies within the range of the western population are at or near carrying capacity. The Corps funded a detailed, extensive, and up-to-date study of the status of the western population of double-crested cormorants, a study that was recently published by our research team, but much of the results of this research are at variance with the DEIS's "minimum viable population" size for the western population.

The specific management objective for the DEIS (~ 5,600 breeding pairs on East Sand Island) is quantified using analyses with unknown uncertainty, large extrapolations outside the available data, and methods that apparently have never received independent peer review. These analyses do not use the best available scientific information and are substantially less rigorous than analyses identifying other salmon recovery objectives in NOAA's 2014 Supplemental Biological Opinion for the Federal Columbia River Power System. The Corps has funded NOAA Fisheries to collect salmonid smolt PIT tags on the cormorant colony at East Sand Island, and to conduct studies of those tag recoveries in order to obtain

accurate, unbiased estimates of cormorant predation rates on listed stocks of salmonids. These results are the best available science on the impact of cormorant predation on ESA-listed salmonid populations in the Columbia River estuary, yet they were not used to assess the benefits of various management objectives for cormorant colony size on East Sand Island. Research to specifically quantify the prospective benefits to ESA-listed salmonids of various cormorant management scenarios has been conducted, but the results of that research were not used to assess or interpret the value of the alternatives relative to other potential levels of cormorant management or other salmon recovery objectives. Finally, the Corps funded our research team to investigate the factors that are responsible for the large inter-annual variation in cormorant predation rates on salmonid smolts; depending on the year, cormorants have included as little as 2% salmonids in their diet or as much as 20%. The results of this Corps-funded study were ignored in setting or interpreting the specific management objective; instead one average per-cormorant smolt consumption rate was assumed for setting management objectives.

In summary, the DEIS was not consistently based on the best available science, science that in a number of cases was paid for by the Corps and is either published in the peer-reviewed scientific literature or destined for publication in the near future. Specifically, more robust scientific information is available to support the quantification of a specific management objective and the analysis of relative risk between non-lethal and lethal alternatives than was selected for use in the DEIS. Consequently, the selection of the Preferred Alternative in the DEIS is neither rigorously science-based, nor defensible from a scientific perspective, regardless of its merits as a management policy for resolving this natural resource management issue.

Sincerely,



Daniel D. Roby, Unit Leader-Wildlife
U.S. Geological Survey-Oregon Cooperative Fish and Wildlife Research Unit
Department of Fisheries and Wildlife
104 Nash Hall
Oregon State University
Corvallis, Oregon 97331-3803
Phone: 541-737-1955
Fax: 541-737-3590
Email: daniel.roby@oregonstate.edu